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EXAMINER

SEVER, ANDREW T

ART UNIT

PAPER NUMBER

2851

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/03/2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-8, 18, 21-26, 30-32, 34-36, 40-42, 44-62, and 78-85 are rejected under 35 U.S.C. 102(e) as being anticipated by Mochizuki et al. (US 6,846,081.)

Mochizuki teaches in figures 1-8 a projector which performs the following method for adjusting a projector, comprising:

a) using an imaging device (105) to sense at least two boundaries defining a projection screen (see column 3 lines 44-46 which teaches that the imaging device captures the shape of the screen which is also shown in figure 2-4 and includes at least two boundaries defining the projection screen), said imaging device being integral with said projector (it is shown integral);

b) determining a transformation to adjust the keystone of an image projected from said projector (as shown in figure 8 keystone is corrected form by the distortion correction circuit which would include developing a transformation)

c) modifying said image projected from said projector in accordance with said transformation (this is what part 111 does)

d) projecting said modified image from said projector, wherein said imaging device and said projector are maintains in a fixed relationship with respect to each other, wherein said imaging device is free from being the projector optics from which said image is projected from said projector (clearly in figure 1 the image device is inside the casing 10 and therefore in a fixed relationship with the projector but does not share the projection optics (103))

With regards to applicant's claims 2-5:

The boundaries include all 4 corners and a pair of edges. See figures 3, 7, and 8.

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With regards to applicant's claims 6-8:

The adjustment includes both horizontal and vertical adjustment (it can fit any shape or distortion and would therefore include both vertical and horizontal.) This constitutes two directions as claimed in applicant's claim 8.

With regards to applicant's claim 18:

See figures 10-17 which teach focus also being adjusted by the same components as does the keystone adjustment and as taught in column 9 teaches the method of adjusting focus, which is free from user initiating.

With regards to applicant's claims 21 and 22:

The focus adjustment is taught to be free from user input in the embodiment of figure 10.

With regards to applicant's claim 23:

See column 14 lines 20-52 teaches that when automatic method fail user input can be used.

With regards to applicant's claim 24:

See above and column 14 lines 20-52, which teaches user input in the form of a pointer.

With regards to applicant's claim 25:

See figure 11, which is a pattern that is projected and sensed by the imaging device.

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With regards to applicant's claim 26:

Since the pattern comprises of white and black images, the light making of those images has different frequencies (white would inherently have all the visible frequencies produces by the projector's lamp, while black would only have non-visible frequencies.)

With regards to applicant's claims 30 and 31:

The pointer is taught to be used to indicate a plurality of directions (corners) of the image.

With regards to applicant's claim 32:

Inherently the image dynamically changes during a user manual adjustment.

With regards to applicant's claims 34-36 and 40-42:

See above.

With regards to applicant's claims 44-47:

The projector senses the location of the screen in the claimed way see columns 3-6.

With regards to applicant's claim 48:

The camera at least sense one-dimension and can therefore be considered a one-dimensional sensor.

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With regards to applicant's claims 49-62:

See above where digital and optical image processing are performed along with mechanical (a user directing it.) Focus adjustment includes moving the lens.

With regards to applicant's claims 78-83:

The projector in the final manual embodiment modifies the projected image after adjusting for keystone effect. In general the image is rectangular.

With regards to applicant's claims 84 and 85:

See above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 10-14, 17, 19, 20, 65, and 67-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mochizuki et al. as applied to claims 1-8, 18, 21-26, 30-32, 34-36, 40-42, 44-62, and 78-85 in view of Kawashima et al. (US 6,592,228.)

Mochizuki teaches in figure 1-8 a projector which performs the following method for adjusting keystoneing (distortion) in a projector, comprising:

a) using an imaging device (105) to sense an image projected by said projector (10 specifically 103, 102, and 101);

b) adjusting the focus of said projector (see the embodiment of figure 25 where focus is also corrected for)

c) determining a transformation to adjust the keystoneing of an image projected from the projector (this is what image distortion correction circuit 111 does);

d) modifying the image projected from the projector in accordance with the transformation (the image is modified by this circuit and the display device drive circuit 112 in order to project the image from the projector);

e) projecting the modified image from the projector; and

f) wherein steps a through d are free from user input (see column 1 which states that the purpose of the invention is a simplified automatic correction system see column 1 lines 32-40).

Mochizuki while teaching an automatic system does not teach what initiates the keystone adjustment process. Such an initiation system is taught by Kawashima in figures 8 and 9 that a user orders initiation of the keystone adjusting process by the remote controller 1 shown in figure 5. Kawashima teaches in column 5 lines 1-10 that by using an automatic system that is triggered by a user, the projector can be quickly set and adjusted with out inconvenient manual projection, further as is well known in the art by using a remote control to control the projector including initiating the keystone adjusting process, a user does not have to be able to physically get to the projector such as the case when the projector is mounted on the ceiling or some other inaccessible place. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide means so that a user can initiate the keystone adjustment process of Mochizuki at a location other than at the projector as this allows for more convenience and easier adjustment for keystone as taught by Kawashima.

With regard to applicant's claim 11:

It is obvious that step b is performed after step a (it would not do much good to image an image projected by the projector prior to the projector receiving a command to project an image for keystone adjustment, since in general the images for keystone comprise of specific patterns that are useful for making such adjustments (see column 4 lines 47-65 of Mochizuki for example which teaches that imaging takes place after the adjustment is initiated.))

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With regards to applicant's claim 12:

The remote can be considered a button of the projector (the remote is specific to the projector, also it is well known in the art where remotes are used to also provide identical function buttons on the actual projector.)

With regards to applicant's claims 13 and 14:

As shown in figure 1 the camera is position in a fixed relationship with the projector (it is inside the overall projector) and does not use the projection lens (103) and is therefore offset from it.

With regards to applicant's claim 17:

See columns 3-6 which teach method by which adjustment is made in Mochizuki Also as shown in the flow chart in figure 1, part 105 sense the image, is detected, then adjusted by part 111 and modified by part 112 and then displayed by the projector 101-103.

With regards to applicant's claim 19 and 20:

In view of Kawashima it would be obvious to have the user initiate the keystone adjustment with a remote control.

With regards to applicant's claims 65 and 67-72:

See above.

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7. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mochizuki in view of Kawashima as applied to claims 10-14, 17, 19, 20, 65, and 67-72 above, and further in view of Hasegawa (US 6,598,978 as cited in the previous office action(s).)

As described in more detail above Mochizuki in view of Kawashima teach a method for adjusting keystone in a projector, which among other things includes an imaging device for sensing a calibration image. They do not teach at least a second imaging device.

Hasegawa teaches having a further sensing device to allow a user to interact with either the projector or with the computer performing the presentation. Hasegawa teaches in figure 1 a projection system including a projector (2), a camera (1), and a pointer (4, which can also be considered a remote control). Hasegawa teaches in column 1 lines 13-22 that such a system allows the user to draw on the display image among other things. Given that it is useful to allow a user to interact with the presentation system and that such a system would be separate from the keystone adjusting system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include additional imaging devices for sensing the images on the screen.

8. Claims 28, 29, 33, 38, 39, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mochizuki et al. as applied to claims 1-8, 18, 21-26, 30-32, 34-36, 40-42, 44-62, and 78-85 above, and further in view of Hasegawa (US 6,598,978 as cited in the previous office action(s)).

As described in more detail above Mochizuki teaches a method for adjusting keystone in a projector, which among other things comprises of a user using a pointer. Mochizuki does not specifically teach what form this pointer takes, however it is well known in the

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projection arts where a projector includes a camera for capturing a projected image to use an optical pointer such as a laser pointer. See Hasegawa that teaches such a pointer/remote control. Accordingly since it is well known to use optical pointers due to their versatility as opposed to mechanical ones and since they allow a user to stand back away from the screen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an optical pointer in the projector of Mochizuki such as that taught by Hasegawa.

With regards to applicant's claims 33:

The remote of Hasegawa includes directional controls. (See figures 3, 4, and 19 among others, which show direction of cursors etc. being controlled by the optical pointer of Hasegawa.

With regards to applicant's claims 38, 39, and 43:

See above.

9. Claims 63 and 64 rejected under 35 U.S.C. 103(a) as being unpatentable over Mochizuki et al. as applied to claims 1-8, 18, 21-26, 30-32, 34-36, 40-42, 44-62, and 78-85 above, and further in view of Su (US 2002/0051095.)

As described in more detail above Mochizuki teaches a method of adjusting keystone in a projector, which among other things comprises of developing calibration parameters (transformation parameters). Mochizuki does not teach how physically these are stored,

however it is well known in the art to store calibration parameters in the form of a look up table in memory. Such a system is taught by SU, which teaches in paragraph 21 that the various detected keystone correction values are stored in a look up table as part of the built-in memory. This is done so that constant recalibration is not necessary; with the transformation saved in memory, recalibration would only need to be initiated by the user when either the projector or screen is moved. Accordingly it would be obvious to one of ordinary skill in the art at the time the invention was made to store the calibration parameters of the projector of Mochizuki in built in memory in the form of a look up table.

Response to Arguments

10. Applicant's arguments with respect to claims 1-8, 10-26, 28-36, 38-65, 67-72, and 78-85 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

US 2003/0210381 to Itaki teaches a distortion correcting method in figures 1-6, which reads on at least some of applicant's claims.

US 6,056,408 to Kobayashi teaches in figures 1 and 2 a calibration system for a projection system.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "W B Perkey", with a stylized flourish at the end.

AS

William Perkey
Primary Examiner